



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,597	03/29/2004	Ravi Prasher	P18285	2876
28062	7590	01/15/2008	EXAMINER	
BUCKLEY, MASCHOFF & TALWALKAR LLC 50 LOCUST AVENUE NEW CANAAN, CT 06840			DINH, TUAN T	
ART UNIT		PAPER NUMBER		
		2841		
MAIL DATE		DELIVERY MODE		
01/15/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/811,597	PRASHER, RAVI
	Examiner	Art Unit
	Tuan T. Dinh	2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 October 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 and 23-26 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-11, 15, 16 and 23-26 is/are rejected.
- 7) Claim(s) 12-14 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Noted of claimed language:

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messina ('200)) in view of Chu et al. (U.S. Patent 6,489,551).

As to claims 1-4, Messina discloses an apparatus as shown in figure 6 comprising:

an integrated circuit (IC) die (16) having front and rear surfaces;
a member, which is a heat spreader (14 having a cap 20) to define at least one micro-channel defined a groove (22 and 46) at the rear surface of the IC die (12), the microchannel to allow a coolant to flow therethrough (column 3, lines 34-36).

Messina does not disclose at least one thin film thermoelectric cooling (TFTEC) device in the at least one microchannel and formed on a rear surface of the die.

Chu shows a module (10) as shown in figure 1 comprising a thin film TEC device (20, column 4, line 23, and column 5, lines 15-16) formed between a thermal space transformer (22) and a chip (12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC as taught by Chu employed in the apparatus of Messina in order to provide active temperature control and reduce a leakage power consumption.

As to claims 5-7, Messina discloses the member is formed of copper, or silicon, see column 3, lines 24-27.

As to claims 8-9, Messina discloses the coolant includes water or de-ionized water (column 3, lines 34-35).

As to claim 11, Messina discloses the member is bonded to the rear surface of the IC die.

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Chu as applied to claims 1-9, 11 above, and further in view of Ritchie (U.S. Patent U.S. Patent 3,232,719).

Regarding claim 10, Messina as modified by Lewis does not disclose the TFTEC device made by BeTe.

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC made by BeTe as taught by Ritchie employed in the apparatus of Messina and Chu in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

4. Claims 15, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Chu as applied to claims 1-9, 11 above, and further in view of Law et al. (U.S. Patent 6,711,904).

As to claims 15, 23-25, Messina and Chu as modified discloses all of the limitations of the claimed invention, Messina discloses the IC die is connected to a substrate (12).

Messina as modified by Lewis does not specific disclose the connection of the IC to the microprocessor.

Law et al. shows a semiconductor device comprising a connection between a chip (106) on a surface of a microprocessor (105).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a microprocessor connected to a chip component as taught by Law employed in the apparatus of Messina and Lewis in order to processing data.

Regarding claims 27-28, Messina as modified by Chu and Law et al. shows a coolant circulation system and a power supply (the system and the power supply are inherently because without the power supply then there is no power to operate the system) to the microchannel and a TFTEC device.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Chu as applied to claims 1-9, 11 above, and further in view of Otey (U.S. Patent 6,410,971).

Regarding claim 16, Messina and Chu do not disclose the at least one TFTEC device includes at least one pair of stacked TFTEC devices.

Otey shows a flexible thermoelectric module (10), see figure 1 having a pair of flexible substrate (12, 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a pair of TFTEC as taught by Otey employed in the apparatus of Messina and Chu in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

6. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Chu and Law, and further in view of Ritchie

Regarding claim 26, Messina as modified by Chu and Law does not disclose the TFTEC device made by BeTe.

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC made by BeTe as taught by Ritchie employed in the apparatus of Messina, Chu, and Law in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

Allowable Subject Matter

7. Claims 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 10/12/07 have been fully considered but they are not persuasive.

Applicant argues:

Messina in view of Chu, specific in Chu does not teach or suggest "a thin film TEC device."

Examiner disagrees because Chu shows a module (10) as shown in figure 1 comprising a thin film TEC device (20, column 4, line 23, and column 5, lines 15-16) formed between a thermal space transformer (22) and a chip (12), the device (20) formed as a layer of film on the surface of the chip (12) or as concluded as a thin

layer/film device formed the chip or component (12). Thus, Chu meets the requirement as claimed.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gutierrez F. Diego can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Tuan Dinh
January 04, 2008.


TUAN T. DINH
PRIMARY EXAMINER

1/4/08